

**Information Technology Coordination Survey for the Transportation
Permitting Efficiency and Accountability Committee (TPEAC)**

Final Report

Revision:

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Executive Summary

The goal of this effort was to discover and document the current (and planned) state of information technology support for permitting activities (preparation, evaluation, tracking and compliance monitoring) across multiple agencies. This will be used to inform the Transportation Permit Efficiency and Accountability Committee (TPEAC) so that TPEAC efforts can coordinate with, integrate into, and potentially enhance those activities. The survey was conducted during the months of April and May, 2003.

Information Technology Survey

The IT survey served as an agency scan for permit-related data systems in current operation, planned systems or planned improvements to existing systems. The survey also characterized the technology environment for each system to enable an assessment of the potential for systems integration across agencies. Agencies asked to participate in the survey included the Washington State Department of Ecology, the Washington State Department of Fish and Wildlife, the Washington State Department of Natural Resources, and the United States Army Corps of Engineers.

Permit Tracking Systems

Efforts to improve access and quality permit-related data are underway at each of the agencies that participated in the survey. Many of these will contribute to “step change” improvements compared to the systems they replace. Trends observed in these systems are:

- Consolidation of multiple permit programs into a single system;
- Embedded performance tracking;
- Design for web accessibility;
- Diverse set of technologies being deployed;
- Continued independence from financial functions.

Technology Environment

The technology environment supporting permitting activities across agencies was found to be diverse, even within individual agencies. Diversity does not preclude system integration. However, technology homogeneity generally minimizes complexity and facilitates integration. A summary of operating, database management, and programming systems is as follows:

- Five (5) operating systems (OS/390, HP UX, UNIX, Sun Solaris, Windows)
- Six (6) database management systems (ADABAS, Oracle, Sybase, Informix, SQL Server, Access)
- Nine (9) programming environments (COBOL, Natural, C, Visual Basic, PL/SQL, Java, ASP.COM, C#.NET, Crystal Reports)

Available Data Survey

The universe of datasets identified as available for permit activities within the state totaled over 330 individual elements. Only a fraction of these were found to have agency 'owners'. The data that is currently maintained by agencies generally originates within the agency and is actively maintained and stewarded. In addition, the rating of quality ranks high (average 3.8 on scale of 1 to 5), while accessibility also ranks high (average 3.5). In addition to these findings, the following observations were made:

- Lack of significant data redundancy provides that interagency coordination is working efficiently;
- Majority of datasets are being maintained in geographic (GIS or geospatially referenced) formats.

Permit Data Requirements

The third aspect of the survey intended to identify from the permitting agency perspective what data were required to complete a successful permit application. In general, it was found that data requirements for individual permit elements are not defined with a great degree of specificity. Regardless of what data are used, field verification is nearly always performed and a great reliance on institutional knowledge and legacy (non-digital) information exists. A summary of the number of suggestions that were offered towards improving data required for permitting include:

- Improvements in the area of wetland mapping, mapping of impacts (post construction), and of mitigation plans.;
- Early communication between agencies to ensure that all data requirements are communicated to the applicant;
- Migration towards electronic forms of communication to reduce document transfer times and free up more time for review.

Opportunities and Recommendations

A number of practical actions with achievable results should be considered to enhance IT coordination across permitting agencies. The majority of these would involve the extension of efforts currently underway. In summary there are three things (an implied fourth is maintaining good data) to focus on to provide the most progress towards streamlining environmental permitting for transportation projects:

- 1) Provide guidance to the applicant that leads them to good data
 - Helps the applicant use the right data the right way; Makes for a more complete application; Reduces time spent in initial review of the application for completeness; Speeds the permits to the next step
- 2) Provide easy access for the reviewer to good data
 - Reduces review time; Requires more active collaboration between data managers and permit reviewers;

- 3) Implement systems that will enable both the applicant and reviewer to monitor progress
 - Enables people to focus on the hold ups; Reinforces real expectations

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Background and Introduction

In May 2001, the Washington State Legislature passed Engrossed Senate Bill 6188 - the Environmental Permit Streamlining Act (RCW 47.06) to coordinate streamlining of the environmental permitting process for transportation projects. The bill created the interagency Transportation Permit Efficiency and Accountability Committee (TPEAC), which is responsible for creating a sustained focus on achieving both the transportation and environmental goals of the state. TPEAC is comprised of a number of sub-committees, one of which is the One-Stop Permitting/Pilot Project sub-committee. A goal of this sub-committee's work is to identify ways to improve the quality, use and accessibility of information in the permitting process. The committee seeks to develop recommendations consistent and compatible with existing and planned IT and data resource projects within the participating agencies.

WSDOT's permitting-related information needs are based on requirements from the environmental resource management agencies. Therefore, the goals of this effort were focused on gathering information that will help WSDOT be responsive and efficient in meeting those requirements. Gathering of information intended to cover several goals. One was to discover and document the current (and planned) state of information technology support for permitting activities (preparation, evaluation, tracking and compliance monitoring) across multiple agencies so TPEAC efforts can coordinate with, integrate into, and potentially enhance those activities. Another goal was to identify where gaps may exist with existing IT resources (data and information systems) and where opportunities to provide better tools and services might exist.

A brief and informal survey was designed to address three main questions:

- What information technology (IT) applications are being used (or are planned) in the permitting process?;
- What data are available for use in the permitting process?; and
- What data are required from the perspective of the permitting agency for each permit (in terms of administering the permit and then monitoring compliance)?

The survey was conducted during the months of April and May, 2003. Agencies contacted to participate in the survey were the Washington State Department of Ecology (ECY), the Washington Department of Fish and Wildlife (WDFW), The Washington State Department of Natural Resources (WADNR), and the United States Army Corps of Engineers (USACE). The survey did not include WSDOT systems nor interview WSDOT staff.

Information Technology Survey

The purpose of the information technology (IT) survey was to gain a high level background and overview regarding what systems were in place or planned at participating agencies. This information will serve as a resource to help guide recommendations that may be made by the TPEAC One Stop Permitting / Pilot Project sub-committee. The IT Survey included the following general areas:

- Permit-related data systems in current operation

- Planned systems or planned improvements to existing systems (and funding status)
- Project management software

For each of the systems identified, a number of specific items were sought, including:

- System status (in development, operational/maintenance, redevelopment or replacement plans, etc.)
- Responsible agency contact
- System elements including:
 - Base operating system
 - Primary development environment
 - “Permits” or “authorizations” (or elements of) included in system
 - Agency sub-units using the system
 - Database environment
 - Application architecture type
 - Primary function of the system

Agencies were also asked to report on whether project management software was being used within the agency, and if so, which.

Considerations Integrating IT Systems and Applications

There are a number of degrees to which IT Systems can be integrated. As a higher degree of integration is achieved, it should follow that the cost of transactions is reduced, as is the time spent to access data, resulting in higher value and more timely information. There are four levels (described below in order of increasing level of integration) used to define the degree of integration:

- **Independent** systems are usually serve a single function and do not share data with other systems. These are typically referred to stand-alone or “stovepiped” applications.
- **Interfaced** systems share data across system boundaries. This requires that standards exist to facilitate data exchange.
- **Interoperable** systems share common processes and data flows across standardized interfaces without requiring human intervention.
- **Integrated** systems may be comprised of several functional subsystems, all of which share interdependent processes. All data and processes are fully standardized and all data are administered centrally.

The status quo condition in the Washington State permitting environment is predominantly one of independent, single-function systems. Within individual agencies, the degree of integration for current systems resides at the lower levels of the scale described above. This is, however, changing with current systems replacement initiatives currently underway. The trend which can be seen through current IT initiatives in each of the responding agencies is towards 2- and 3-tiered architectures which are inherently more ‘*integrate-able*’. Tiered

architectures separate the data layer from other layers (such as the application or presentation layers) which generally make the data more accessible and the overall system more flexible and adaptable.

IT system architecture can determine the degree of integration that can occur between existing systems. Legacy mainframe systems, which integrate data, process, and presentation into a tightly wrapped application, are candidates to be interfaced with, but present significant technical challenges to interpretability. Overcoming these technical challenges will require investment in aging systems and may be difficult to justify. Modern technical architectures, such as client/server and n-tier, provide much greater opportunity for improvements to integration that represent reasonable, achievable efforts. This is mainly because their data stores are more accessible using a wider range of technical avenues. Certainly, internet technologies which distribute access via the web browser have introduced a wealth of possibilities for leveraging information.

Description of Existing Systems

A number of existing systems were described by survey participants as relevant to environmental permitting of transportation projects in Washington State. The results reported here do not necessarily represent a comprehensive inventory of existing systems within participating agencies, but rather represent those deemed most relevant to transportation project permitting.

Washington State Department of Ecology

The Washington Department of Ecology reported on four systems. Three of the systems are currently maintained in operational mode and the fourth is currently coming on line.

Facility/Site Identification System

This web-enabled system provides a central repository for information relating to facilities and sites of interest to the department. It serves all Department of Ecology programs and provides critical information for each subject facility/site such as physical location, ownership, activities that occur at the location, as well as the reason(s) for the Department's interest. This system connects permitted activities with locations and parties associated with these activities.

The operating system varies depending on system component. The following operating systems are in use for each respective component.

System component	Operating System
Database Server	HP/UX
Web Server	Windows 2000
GIS Server	Sun Solaris
Client	Windows 2000 and Windows XP

The database environment includes Sybase 11.x for tabular data and ArcInfo 8.x and SDE for GIS data.

The primary development environment is Visual Basic (VB) and Active Server Pages (ASP).

Billing and Revenue Tracking System (BARTS)

This tiered, web client system provides a central repository for information relating to billing and revenue information for most Department of Ecology permits. It serves the following agency sub-units: Fiscal and Budget Office, Water Quality Program, Air Program, and Solid Waste Financial Assistance Program. This system tracks all information relating to permit fees. Permit fees tracked through the system currently include wastewater, stormwater, gas vapor, general registration, air operating, development/oversight and biosolids. The annual revenue billed through this system for the 2002 fiscal year was approximately \$14 Million.

The operating system varies depending on system component. The following operating systems are in use for each respective component.

System component	Operating System
Database Server	HP/UX
Web Server	Windows 2000
Client	Windows 2000 and Windows XP

The database environment is Sybase.

The primary development environment is Java (Sun), Visual Basic Scripting (VB script), Active Server Pages (ASP) and Crystal Reports.

Public Permit Data System (PPDS)

This web-based system provides a repository for permit information relating to regulatory information for many of the Department of Ecology permits and authorizations. In full production, it will serve all of the Department's programs. Permits and authorizations to be tracked through the system will include, but are not limited to: Air Quality and Operations, Source Pollution, Clean Water Act (CWA) Section 401, Water Quality Certificates, Shoreline Use, Pesticide Use, Waste Treatment/Storage/Disposal, Pollution/Stormwater discharges, Lab accreditation, Water use/Well construction and others.

The operating system is consistently Windows based, both for the server (Windows 2000) and client (Windows 2000 and Windows XP).

The database environment is SQLServer 2000.

The primary development environment is JavaScript, Visual Basic Scripting (VB script), and Active Server Pages (ASP).

Water Quality Permit Life Cycle System(WPLCS)

This client/server database application is used for permit tracking. Permits tracked in the system related to the National Pollution Elimination System (NPDES) and State Wastewater Discharge permits. Permitted facilities may be covered under individual municipal or industrial discharge permits, or under one of a variety of wastewater discharge general permits (Clean Water Act Section 402), which include the stormwater industrial and stormwater construction permits. The application is currently licensed for up to 60 concurrent users. Plans are for making this application web-accessible by

migrating to a thin-client architecture. Text-file reports are currently served for public access over the web.

The operating system is Windows 2000.

The database environment is Oracle.

The primary development environment is Oracle PL/SQL.

Washington State Department of Fish and Wildlife

The Washington Department of Fish and Wildlife reported on three systems. Two of the systems are currently maintained in operational mode, with plans for improvements and/or replacement. The third is currently in the testing process.

HPA WordPerfect Macros

This desktop system facilitates the review of Hydraulic Project Approval (HPA) applications by field staff. This information is then entered manually into an Access Database at headquarters. The system is an extension of the WordPerfect word processing application.

HPA Database

This client-server database system provides a restricted-access repository for all current and recent HPA data (1997 to present). The system is currently being used to track all HPA activity and provide reporting for management, public disclosure and regulatory tracking needs. The Habitat Program is the primary use of this system.

The operating system is Windows 2000.

The database environment is Access 2000.

The primary development environment is Visual Basic for Applications (VBA).

SalmonScape

This tiered, web client system provides a webGIS interface to data mainly relating to hydrology and fish distribution including the Salmonid Stock Inventory (SaSI) and Salmon and Steelhead Habitat Inventory and Assessment Program (SSHAP) databases. The system has been designed to allow non-technical personnel to view data and make reports. It is intended for use by all WDFW programs and eventually the public.

The operating system varies depending on system component. The following operating systems are in use for each respective component.

System component	Operating System
Database Server	Windows 2000
Web Server	Sun Solaris

The database environment is SQL Server.

The primary development environment is Java, JavaScript and ArcIMS.

Washington State Department of Natural Resources

The Washington Department of Natural Resources reported on three systems. All three of the systems are currently maintained in operational mode. One system is partially funded for replacement.

Asset Performance System (APS)

This mainframe system provides a means to track contract applications relating to assets under the stewardship of the Department of Natural Resources (DNR). The system is currently being used by DNR regions with agricultural agreement customers in order to managed assets and facilitate the contracting process.

The operating system is OS/390.

The database environment is ADABAS.

The primary development environment is COBOL and Natural.

Revenue Management System (RMS)

This mainframe system provides billing, accounts, and revenue management for all regions and most divisions of the Department of Natural Resources. The system is used to track information relating to commodities processed by the Department such as leases, permits, rights of way, communication sites, easements, etc. A request to replace RMS was approved by the Governor but has not been fully funded.

The operating system is OS/390.

The database environment is ADABAS.

The primary development environment is COBOL and Natural.

Forest Practice Application System (FPARS)

This web-accessible client/server system provides regulatory review and tracking for applications for use of or activity on forested lands. It serves the Forest Practices Division, Region offices, and other interested agencies (Departments of Ecology, Agriculture and Fish and Wildlife), tribal interests and the public.

The operating system is Sun Solaris and Windows NT.

The database environment is Oracle.

The primary development environment is Oracle, Visual Basic and web-programming languages including Java, html, xml, ASP.

United States Army Corps of Engineers

The U.S. Army Corps of Engineers reported on one system. This system is currently slated for replacement in the near future.

Regulatory Analysis and Management System (RAMS)

This client/server system provides comprehensive permit tracking from receipt of application to monitoring to finalized action. It supports all regulatory functions in the Seattle District. Hundreds of fields in the system track various aspects of all permits including alleged violations of permit terms and conditions. This system has been in use by the Seattle District since November 1991.

The operating system is UNIX.

The database environment is Informix.

The primary development environment is the C programming language.

Description of Planned Systems

A number of systems are planned or in varying stages of early development. Several which are nearing production status are described as existing systems above.

Washington State Department of Ecology

A system to track permit-related activities in the Department is currently in development. This new system will track Joint Aquatic Resource Permit Application (JARPA) permit status, the issuance of certifications and mitigation plan approval. The system may eventually cover many JARPA-covered permits including Clean Water Act Sections 401, 404, 9 and 10 and Coastal Zone Management (CZM). It will be used by 401 specialists, wetlands specialists, DOT liaisons as well as some support staff.

In the current phase of the project a set of use case scenarios are being created to inform development of application code. The system will use a thin-client (web browser) architecture using SQL Server 2000 running on Windows 2000 for the database server. Development will be in the Microsoft .NET environment with the C# programming language. The system is currently funded by the TPEAC.

Washington State Department of Fish and Wildlife

Development of a system to replace the existing WordPerfect macros is underway. The project is currently funded through requirements development, prototyping and implementation planning. Requirements are currently be collected. Funding to build the system will be required.

Data coverage for the SalmonScope application is still under development for many parts of the State.

Washington State Department of Natural Resources

The Department of Natural Resources is planning to replace the Revenue Management System (RMS). Modernization of this system may provide an opportunity to enhance permit tracking at this agency.

United States Army Corps of Engineers

The U.S. Army Corps of Engineers Headquarters is currently funding the development of a system that will replace RAMS (described above). The new system, Operations and Maintenance Business Information Link (OMBIL) Regulatory Module (ORM), may be deployed as soon as October 2003. In addition, the Corps is seeking to improve its GIS resources.

Summary of Technology Environment

The technology environment across survey participants is diverse, even within individual agencies. Systems in use by individual agencies with similar function, such as permit tracking applications, differ in the architecture and operating environments in which they are implemented (i.e. mainframe, client/server and tiered). The following table summarizes

the operating system, database, and development (programming) environments reported in the survey.

Technology Environment Summary

Operating System	Agency
OS/390 Mainframe	WADNR
HP UX (UNIX)	ECY
UNIX	USACE
Sun Solaris	ECY, WDFW, WADNR
Windows Family (2000, NT, XP)	ECY, WDFW, WADNR
Database Management System	Agency
ADABAS	WADNR
Oracle	ECY, WADNR
Sybase	ECY
Informix	USACE
SQL Server	ECY, WDFW
Access	WDFW
Development (Programming) Tool	Agency
COBOL	WDNR
Natural	WDNR
C	USACE
Visual Basic/VBScript/VBA	WDFW, Dept. of Ecology
PL / SQL	Dept. of Ecology
Java/JavaScript	WDFW, Dept. of Ecology
ASP	Dept. of Ecology
.NET/C# ¹	Dept. of Ecology
Crystal Reports	Dept. of Ecology

1. In use on a system currently in development.

Challenges and Barriers

A diverse technology environment does not preclude the achievement of higher levels of integration between agency systems. It does, however, impact the complexity, level of effort and cost to maintain interfaces between systems. Depending on the business need driving development of a system interface, functional requirements to meet needs may necessitate interfaces between several systems or reveal gaps in existing systems that cannot satisfy needs. This is almost certain to be the case as each agency differs in the way it is functionally organized and how its business systems to supports its functions are aligned.

Technical obstacles alone will not prevent systems to be integrated between agencies. Policy considerations regarding security and access to departmental systems will require deliberation and negotiation. Before any efforts to integrate systems between agencies, a case must be made as to whether it is desirable or practical to do so.

Opportunities and Recommendations

There are a number of measures to be taken which facilitate integration between systems. The most important is the development of standards. Standards can be applied to all aspects of IT systems and should be developed to cover the three main “tiers” of information systems: data, processes (applications) and presentation (user interfaces).

Implement standards to facilitate IT systems integration.

Data standards are the most fundamental requirement for enabling systems to be integrated. Implementing data standards provides the most immediate and practical opportunity for establishing interfaces between systems and automating exchanges between agencies.

Standard Project Identifier

A data standard that could be considered for transportation projects, as an example, is how projects are identified in order to facilitate exchange. A “standard project identifier” would allow a single reference for project permit approvals independent of which permit or agency is involved. Data standards should focus on how the data is to be formatted (data type, field name) as well as which attributes are to be associated with the data in order to enable meaningful exchange. Existing standards and forums for establishing state and federal data standards should be used as the start point for determining a set of data standards to cover environmental permit tracking and processing.

System Design/Documentation Standards

Processes that serve as models for application systems should be implemented as software in the most generic way possible. These diagrams must include representation of data creation, update, and flow. Following this principle in developing application architectures will facilitate future system integration, will more likely produce reusable software components, and will position the system to be more adaptable to changing business needs. Documenting systems using a standard methodology and providing the artifacts of system development to inform subsequent efforts will increase the likelihood of system integration at some level.

Presentation Standards for Document Format and Graphical User Interface.

Presentation standards are another opportunity for immediate and practical improvement to systems. Simply standardizing the look, feel and functionality of a user interface can reduce the time to acquire data for all involved in the permitting process. Presentation format standards can also produce significant returns. Standardizing on, for instance, PDF files versus WordPerfect or Word for document exchange can eliminate time lost due to file compatibility and conversion. Another example for the application graphical user interface (GUI) presentation standards is the use of the State of Washington web page ‘Access Washington’ template by the Natural Resources Data Portal project as a common, interagency standard presentation. Standards should consider accessibility guidelines such as U.S. Section 508 (<http://www.section508.gov/>)

and the World Wide Web Consortium's Web Content Accessibility Guidelines
(<http://www.w3.org/WAI/>).

Available Data Survey

In addition to surveying IT systems, a data survey was performed to identify which data sets are currently available to permit applicants and agency staff for review of environmental permits for transportation projects. In addition to identifying which data are available and being used by agency staff, an effort was made to determine which format, what quality, and how accessible are the data sets.

There are three main types of permitting-related data: 1) data relating to a proposed project or activity for which a permit is being sought; 2) data representing the environmental characteristics and conditions of resources may be impacted by the proposed project or activity; and 3) data relating to the administrative process of applying for and processing permit applications. The focus of the available data survey was on the second type. Other white paper efforts in support of the TPEAC addressed types 1 and 3. Permit tracking systems (like those described in an earlier section of this report) contain type 3.

Description of Approach

A master list of environmental datasets used to evaluate potential transportation impacts was assembled from a number of sources. These sources were the Natural Resources Data Portal (NRDP) catalog listing, the WSDOT Environmental Affairs Office Geographic Data List, and the Mid-Atlantic Transportation and Environment (MATE) Framework Group Data Sources List. All data in the combined list were classified based upon MATE environmental issue categories and WSDOT Environmental Activities Data Model subject area definitions. Each participant reviewed a combined that list totaled more than 330 individual data elements. Many of these differed only in their geographic extent, scale and/or currency.

The list was distributed in spreadsheet format with additional columns representing seven areas on which the survey was seeking to assess data. An agency representative completed the survey by answering all questions as they applied to relevant data elements.

- 1) Are you (the agency) responsible for either the creation or maintenance of this data from the viewpoint of other governmental organizations (if the Legislature / Congress funds you to do it, the answer is Yes)? (Yes/No)
- 2) Is this data actively managed? - i.e. are there regular updates or a formal distribution or maintenance program? (Yes/No)
- 3) What are the best known source(s) for data on this topic/subject? "Best Known" would mean most complete, current and detailed for use in permit or authorization decision making. (please list)
- 4) What (primary) format is this data maintained or distributed in? (publications (reports), databases or spreadsheets, GIS, CAD, etc..)
- 5) How would you rank the quality of this data on a scale of 1 to 5? (1 being poor quality, 5 being "meets all needs for making our permitting decisions")

- 6) How would you rank the accessibility of this data on a scale of 1 to 5? (1 being poor, 5 being "fully accessible to all, in or out of the agency, who require it")
- 7) If the data is currently not in a digital, data oriented format: Based on its value to permit decision making, should this data element be a high priority for conversion to digital?

Discussion of Data Available

The majority of data used in permitting has geospatial attributes and as such, much of it is maintained in GIS formats for use in a number of specialized applications. Most data currently maintained, according to survey respondents, originates within each respective agency. Federal sources such as the United States Geologic Survey (USGS) and Environmental Protection Agency (EPA) are also commonly in use.

Washington State Department of Ecology

Data within the Department of Ecology appears to be of sufficient quality to meet most permitting decision needs. Many of the datasets are actively maintained and many have stewards. The large majority are stored in GIS format (coverage, shapefile and grid).

Twenty-seven data elements were reported as produced by the Department of Ecology for use in permitting. Of the 27, the Department indicated 25 had stewardship. Nineteen of the 27 are under active administration. A total of 40 data elements were identified as being used.

The average reported quality rank was 3.9 (on a scale of 1 to 5). Accessibility ranked even higher (4.2) indicating that the data is easily available to those that require it.

Washington State Department of Fish and Wildlife

The WDFW survey responses do not include aquatic species data.

Datasets used within the Department Fish and Wildlife also appear to meet most permitting needs. All but one of the datasets are actively maintained and all but 2 have stewards. The large majority (all but one) are stored in GIS format.

Eight data elements (of a total 11 non-aquatic used) were reported as produced by the Department for use in permitting. Of the 8, the Department indicated all had stewardship. All but one was reported under active administration.

The average reported quality rank was 3.9 (on a scale of 1 to 5). Accessibility ranked lower (3.4) indicating that some improvements could be made to make certain datasets more readily available.

Washington State Department of Natural Resources

Responses from all Department of Natural Resources data stewards were not available during the survey period. Twenty-four of 28 datasets attributed to WADNR were reported on.

Datasets within the Department of Natural Resources were reported to be under active stewardship (with one exception). Of the datasets reported on, all were stored in GIS (or compatible) formats. All but four of the datasets were reported to be under active administration.

The average reported quality rank was 3.7 (on a scale of 1 to 5). However, 4 of the datasets were reported to be of unknown quality. Accessibility on average was ranked at 2.7. This was most likely due to the fact that several datasets were not available via the web and one dataset was not publicly circulated except on a case by case basis. Several efforts underway at WADNR will improve data accessibility which includes participation in the Natural Resources Data Portal project and construction of a WebGIS by which the most commonly used data will be distributed.

United States Army Corps of Engineers

Did not receive a response. It was reported that the agency is more a data consumer than a data producer and maintainer.

Summary of Available Data

From the perspective of the data stewards and data managers (whom for practical reasons comprised the respondent pool to this portion of the survey), management of data used in environmental permitting is generally very good. The high overall ranking of data quality (3.8) indicates current data meets business needs for existing permitting practices. Further inquiry into why some datasets were rated low in terms of accessibility might identify some areas where resources could be applied for improvement over the existing situation. The lack of any significant data redundancy proves that inter-agency coordination is working to delivery efficiency in information resource management.

Opportunities and Recommendations

Extend data coordination towards provision of an “environmental data service”

Support should be given to the ongoing coordination of data between agencies. Extension and expansion of current coordinated activities, such as the Natural Resources Data Portal (NRDP), the Project Information System (PRISM) and the Uniform Environmental Project Reporting System (UEPRS), could result in an environmental data “service.” This service would allow common datasets to be accessed directly by permit applicants and reviewers for transportation projects and improve consistency and efficiency in the use of environmental data.

Ensure that critical, high-value datasets are stewarded and maintained

It is clear parties involved in the permitting process utilize high quality sources of ‘base’ data developed and maintained by agencies not directly involved with permitting. To the extent these sources contribute high value and relevance to the permitting process, steps should be taken to ensure their continued maintenance and stewardship to meet environmental permitting needs.

Continuous improvement for highly used, temporally significant datasets

Certain critical datasets used in the preparation and review of permit applications could be put onto a program of continuous improvement. This would require the development of a process to capture data being developed by parties outside of permitting agencies and would include data developed on a project level either by applying agency biologists or consultants using data collection standards (a process similar to the Department of Ecology’s data submittal process which serves as part of the Agency’s Environmental

Information Management System). A number of datasets would be excellent candidates for this approach include: stream location and attributes; wetland delineation and classification; boundaries of impacted areas; locations of mitigation sites; species habitat and observations; and high probability areas for cultural resource occurrence.

Permit Data Requirements

The third main aspect of the survey was geared towards identifying, from the permitting agency perspective, which data are required to complete a successful permit application. For each of the permits issued by the agencies responding, it is clear the responsibility for the quality and accuracy of permit data lies with the permit applicant.

Description of Approach

A number of questions with an information technology focus relating to individual permit data requirements were included in the Environmental Permit Streamlining White Papers survey. The target audience for these surveys were agency permit review staff. The questions were designed to develop an understanding of how permit agencies expect applicants to acquire the required information, how it is reviewed, what technologies are used in review, and how legislative reporting requirements/requests are satisfied. In addition, a number of questions were added to solicit ideas from respondents for improvements relating to data and process. The seven questions are listed below:

- 1) For each element of the subject permit/approval, where and how do you expect applicants to get this information?
- 2) For each element of the subject permit/approval, how do you check the accuracy of the applicant's information?
- 3) Which of the following do you use in permit evaluation? (GIS, GPS, Remote Sensing, Web Resources, Field Investigation)
- 4) Please provide the name(s) and phone # of one or two staff who assist in technical review of permit application data.
- 5) Are you required to provide responses to legislative questions relating permits your agency issues? (Y/N) (not unless specifically contacted by the legislature).

Do you have the data resources and systems required to respond to these request?
(Y/N)

If not, what was the last management/legislative question you had to answer with a less than desirable approach?

- 6) What ideas do you have for improving the permitting process in terms of improved data management, coordination, or systems?
- 7) For transitioning to a truly electronic (paperless) permitting process, what do you see as the three greatest opportunities and barriers

Discussion of Data Requirements

Data required for use in developing permit applications do not appear to be defined with any significant specificity. The resulting lack of specificity results in review activities more intensive than might otherwise be necessary, if there were more clearly defined requirements, which would result in predictable data quality for permitting. Each of the

sections below represents a synthesis of agency staff input received during the survey. The opportunities for improvement identified in this section are paraphrased from individual survey responses.

During the course of the survey, two approaches to reviewing data used to prepare applications. One approach involves virtually no review and assumes the application information is accurate and complete in good faith. Less time is spent doing data resource. Another approach is more data research heavy and would benefit from better access to data and tools. Scenarios like the proposed Multi-agency Permit Team (MAPT) approach to permit review would, like the latter approach described, benefit from access to available data.

Washington State Department of Ecology

Key requirements for the 401 Water Quality Certification are site details and project designs. For the Floodplain/Flood Hazard Area Development permit, FEMA maps, and other hydrographic and topographic sources are required. Accuracy of application information is checked against a number of internal resources including the CWA Section 303(d) list of impaired waterbodies. Site visits are also commonly used to check accuracy. Web resources and paper-based information systems (such as historical maps) are widely used, as are discussions with other staff, both inside and external, to the agency. Some accuracy checks are performed at the local level.

Agency respondents indicated that opportunities for transitioning towards an electronic permitting process commence with consistent information. Technologies, data and infrastructure exist within the agency could be used to provide reviews with electronic access to current and consistent data for permit review. Systems could be focused towards getting faster decisions for the applicant, achieving greater retention of institutional memory and using higher quality information in decision-making. Responses indicated that technology could also be applied to increasing transparency in the public information process. Agency staff indicated barriers to improvements include system/file incompatibility between agencies (even at the level of office productivity software). As such, significant time is lost to technology troubleshooting. Respondents also suggested in an electronic process, access to permit information would have to be limited to appropriate parties. Other typical barriers such as lack of funding and training also exist.

Washington State Department of Fish and Wildlife

Most information used to fulfill data requirements for hydraulic permit approval applications comes from the Department's own detailed information. Applicants also make use of Federal, State and local sources. Accuracy is checked against the Department's own information as well as its institutional knowledge. GPS, Web Resources, legacy sources (paper maps) and field investigation are used to evaluate permits as well.

Agency staff responses indicated improvements could be made to extend the data lifecycle by ensuring coordination does not end with the issuance of a permit (i.e., it needs to continue while a project is constructed). Information must be available to those involved at the permitting state so they can approve appropriate actions and changes as necessary. Another improvement identified by respondents related to an increase in early communication of a project scope in order to ensure cumulative impacts are properly identified and addressed.

In terms of transitioning towards an electronic process, respondents indicated focus should be on reducing transaction time to enable more timely information exchanges. It was acknowledged however, while electronic transactions can produce time savings, they may lead to a greater risk of misinterpretation than verbal communication.

Washington State Department of Natural Resources

Requirements for forest practices applications are defined in the Washington Administrative Code. They are specific as to the type of information that is required, but do not identify required sources or formats for presentation. On-site reviews are conducted to check the accuracy of critical elements of the permit application. In addition to field investigation, GIS, Web resources and information from other agencies are used in the permit evaluation.

Opportunities for improvement, as identified by agency respondents, focused on improving communication and coordination beginning with early notice to permitting agencies of an incoming application. In terms of coordination, joint site reviews would be of value, as would tracking follow through by applicants and agencies on activities needed to issue a permit.

According to agency staff responses, a key benefit of automating the permitting process towards a paperless system would be a reduction of time lost to the transfer of paperwork. Reducing the transaction time by electronic document transfer would allow more time for review. Barriers to improvement are cost, compatibility of potential improvements with current IT systems, and the time and costs associated with training staff to use new systems.

United States Army Corps of Engineers

Applicants are expected to acquire information from appropriate sources such as other State and Federal agencies. Accuracy is checked using independent field review, in consultation with expert resources within the Corps of Engineers and with other permitting agencies. Field investigation is used along with institutional knowledge to review applications.

Respondents indicated improvements could be made in the area of wetland mapping, including how they are delineated, how impacts are illustrated and how cumulative impacts are calculated. Mitigation plans need to be mapped more often using standard procedures in a common format.

In terms of transitioning towards an electronic permitting process, responses indicated that improvement in consistency of file formats and organization can provide immediate benefits. For example, simply increasing the use of e-mail will serve to immediately remove a significant amount of cost and time associated with paper transactions. This will enable more of the review period to actually be used effectively.

Summary of Data Requirements

Data requirements vary significantly between agency as can be expected due to the diverse types of projects and resources that may be in play. Regardless of what data are used, it appears some sort of field verification is nearly always performed. There is an understanding that data is available to applicants from other agencies and an expectation they will use it. It is clear that the documentation of what data are used in preparation of permit application is insufficient.

Interestingly, survey respondents did not identify any specific subject areas as needed but non-existing information. In the actual interview sessions, data set gaps and limitations were discussed. In some cases, reviewers were informed of improved available data during the interview session. These included Priority Habitats and Species, Natural Heritage, Salmon and Steelhead Habitat Inventory and Assessment Program. Opportunities for improving the available data on wetlands and mitigation sites, habitat types, land use / land cover, impervious area and infrastructure were discussed.

Opportunities and Recommendations

Here it is helpful to reiterate this survey considered that there are three main types of permitting-related data: 1) data relating to a proposed project or activity for which a permit is being sought; 2) data representing the environmental characteristics and conditions of resources may be impacted by the proposed project or activity; and 3) data relating to the administrative process of applying for and processing permit applications. The recommendations below will refer to these types as they are defined here.

There are several areas of opportunity in which improvements can be made for permit application data requirements. The first is to increase the consistency by which data are being used, the second is to improve the presentation of the data in order to facilitate verification and review.

Documentation of data used to prepare application

A first step towards improvement might be to implement a standard method of documenting what datasets are used and some key attributes relative to their source, currency, accuracy and scale. This would apply to both types 1 and 2 data as they are described in the prior section. In terms of type 2 data, the standard must acknowledge the differences in available data coverage and quality between geographic areas. This documentation method would immediately provide the reviewer an understanding of data limitations and inform the focus of their review. It may be the case that the review deems a source inadequate and can send the applicant back for more work before spending time in field. Applicants may be encouraged to seek out and use more accurate and current data if they are required to provide the source.

Training/certification for environmental data users (applicants and reviewers)

Another step for consideration is the development of some type of training/certification program (co-developed by permitting agencies) to ensure applying parties have full understanding of what data are available and appropriate, what their limitations are, and how they should be applied and maintained. The goal of this effort would be to: increase the competency of the reviewer to use good data to provide the correct information; to increase the confidence-level the reviewer has in the information the applicant is providing; and to increase the competency of the review in utilizing data in their work. For type 1 data, the individual whom is trained/certified could be a project engineer responsible for all information relating to the proposed project. For type 2 data, this person could be an agency data manager whom is responsible for all information provided to staff throughout the organization. For applicants with modest staff resources, it may be that the individual preparing the actual applications is certified for all types. Such an effort would require training, tool development and establishment of quality control/quality assurance

procedures in the use of data at both the applicant and review ends. Before technology solutions can be widely implemented, gaps in basic infrastructure, skills and tools need to be filled.

Data/permit process consultation to applicants

The responsibility for data management in any data-producing organization should be expanded to include ownership and responsibility for how data are used in the review of permits or in other terms how it is applied to the core business. This would be the role of a data steward. The data manager should serve as a resource to reviewers as to how data are maintained, but they would primarily serve a technical data management function. They would then partner with data stewards whose responsibility would be to promote the appropriate use of the data and respond to new data requirements. A potential alternative approach would be possible if the data manager or data management staff should understand the permitting process well enough to provide data consultations to applicants and be able to guide them in the correct use of the data for analysis.

Increase use of aerial imagery for application review

Increasing the use of aerial imagery will also serve to improve the application review process. Both as it might be used by the applicant and the reviewer. When the applicant uses imagery as a base for a data overlay, it helps a reviewer more quickly associate data with the real world. This will help to sharpen the focus of site visits, or may eliminate the need for other site work entirely. The use of imagery, however, comes with its own issues including the currency of the image and its spatial accuracy.

Other Issues Identified During the Survey

During the course of this survey, a number of additional issues were identified. These issues were neither intended nor expected to be uncovered but are important to mention. The issues do not directly relate to IT systems or data but to certain human factors or institutional phenomena.

There seems to be, in some cases, a disconnect between the individuals responsible for data management and the individuals involved in permitting. In other words, clear connections between business needs and data are sometimes not apparent and in other cases might not exist. In several instances, the dialogue created by this survey led to discovery of data otherwise unknown to a permit specialist and of some business process that was otherwise unknown to a data manager. While the disconnect between data and business needs is an issue, perhaps a far greater issue to overcome might be the capacities of permit reviewers to utilize the data, both in terms of tools and skills. It is clear that education and skills development will be a significant barrier to implementing technology improvements.

A great deal of time appears to be spent during permit reviews due to the applicant not providing the appropriate information in the requested format. In some cases, figures that accompanying applications do not comply with requirements; in other cases, entire volumes of design drawings are provided when only one or two specific sheets may be required or desired. These conditions result in requests for clarification, iterations, and other inefficiencies.

The degree to which review processes and procedures are defined differs greatly between agencies and within agencies. It will be difficult to develop consistent application information unless a review process is clearly and consistently defined while taking into account the wide variety of conditions a project may require. Establishing consistency in permit review, to whatever level it can be accomplished, will help to focus the collection and maintenance of data in support of review activities. Improving the efficiency of review and improving the applicant's likelihood of timely approval.

The last issue concerns the wide range of confidence that exists in permit reviewers as to what data are used in developing permit applications. This issue is somewhat addressed in the prior discussion of data requirements. It ranges from having total confidence and trusting quality and accuracy for all information provided by an applicant to having little trust and meticulously verifying every aspect of the information provided. Documenting the data that are used, developing and maintaining data to standards, and certifying agencies as to the use of data can help to address these concerns.

Opportunities and Recommendations

Training/tools for figure/plans preparation

Specific training and tools to improve figures and plans that accompany permit applications would serve to reduce the number of iterations required. A first step could be in the form of basic awareness training to help staff understand the importance of published requirements and how to meet them. Following that, tools could be developed such as templates and standard symbol sets, to help control the production environment and facilitate compliance with submittal requirements.

Permit application review process mapping

The development and communication of process and procedure definitions would facilitate communication between those who are focused towards data management and those who are focused towards application review. This would help to ensure business needs are being met and data are being used. Definitions should be developed in a common format across individual programs so they can be effectively compared and contrasted. Where data inputs and outputs occur, additional detail should be developed to clearly document how the data are used. The practice of process mapping would be a valuable tool in this effort.

Recommendations Synthesis

Upon review of the recommendations offered in response to each individual section of the IT survey, it became clear the recommendations could be synthesized into few major categories. The recommendations that follow are separated into the following categories: Technology Focus, Data Stewardship Focus and Process Focus.

Technology Focus

1. Implement standards to facilitate IT systems integration.

Data standards are the most fundamental requirement for enabling systems to be integrated. Implementing data standards provides the most immediate and practical opportunity for establishing interfaces between systems and automating exchanges between agencies. The alternative to using standards to allow disparate systems to be interfaced between agencies is to create new systems that span agencies. This latter option would be extremely difficult and expensive to implement and is likely infeasible. Existing efforts at establishing IT standards (such as those developed by the Department of Information Services (DIS) and the Washington Geographic Information Council (WaGIC)) are important considerations when implementing IT systems. Data standards should focus on how the data is to be formatted (data type, field name) as well as which attributes are to be associated with the data in order to enable meaningful exchange. TPEAC should consider supporting the use of standards such as those described below in development of systems used in support of permitting.

1A. Investigate feasibility for a standard transportation project identifier

A data standard that should be considered for transportation projects, for example, is how projects are identified in order to facilitate exchange. A standard transportation project identifier would allow a single reference for project permit tracking independent of which permit or agency is involved. While this may currently be impractical to pursue as it presents non-trivial implementation challenges, it would accrue wide-ranging benefits. An issue that would need to be addressed are whether the standard covered only transportation projects, or others as well. Other legislation may eventually drive this, but TPEAC might consider investigating the scope and feasibility of such an effort.

1B. System design/documentation standards

Processes that serve as models for application systems should be implemented as software in the most generic way possible. Following this principle in developing application architectures will facilitate future system integration, is more likely to produce re-useable software components, and positions the system to be more adaptable to changing business needs. Documenting systems using a standard methodology and providing the artifacts of system development to inform subsequent efforts will increase the likelihood that systems can be integrated at some level. Information Services Board's subcommittee on geographic information technology is beginning to take on issues like this for GIS-related systems and applications. The Department of Information Services has a significant role in standards for all major applications within the state.

1C. Presentation standards for document format and graphical user interface.

Presentation standards are another opportunity for immediate and practical improvement to systems. Simply standardizing the look, feel and functionality of a user interface can reduce the time to acquire data for all involved in the permitting process. Presentation format standards can also produce significant returns. Standardizing on, for instance, PDF files versus WordPerfect or Word for document exchange can eliminate time lost due to file compatibility and conversion. Another example for the application graphical user interface (GUI) presentation standards is the use of the 'Access Washington' template by the Natural Resources Data Portal project as a common, interagency standard presentation. Standards should consider accessibility guidelines such as those prescribed by Washington State Department of Information Services, (<http://www.wa.gov/dis/webguidelines/>), U.S. Section 508 and the World Wide Web Consortium's Web Content Accessibility Guidelines.

2. Investigate opportunities to extend data coordination towards provision of an "environmental data service"

Support should be given to the ongoing coordination of data between agencies. Extension and expansion of current coordinated activities, such as the Natural Resources Data Portal (NRDP), the Project Information System (PRISM) and the Uniform Environmental Project Reporting System (UEPRS), could result in an environmental data "service." This concept would be an internet-based technology to provide a means by which a data "subscriber" could automatically download datasets as improvements were available or possibly attach their applications directly to a central environmental data server. The Salmon and Watershed Information Management team is working on this type of solution as an extension of the Natural Resources Data Portal service. This service would allow common datasets to be accessed directly by permit applicants and reviewers for transportation projects and improve consistency and efficiency in the use of environmental data. TPEAC funding could be used to advance this effort.

3. Investigate potential for training/tools to facilitate figure/plans preparation

Specific training and tools to improve figures and plans that accompany permit applications would serve to reduce the number of iterations required. A first step could be in the form of basic awareness training to help staff understand the importance of published requirements and how to meet them. Following that, tools could be developed such as templates and standard symbol sets to control the production environment and facilitate compliance with submittal requirements. The recommendation to develop Tools that would improve figure consistency and quality should be coordinated with the recommendations relating to standard figures and application form supplements discussed in the Common Data Requirements White Paper developed in coordination with this survey.

Making training and tools available to WSDOT staff will increase the competency for preparing them over time. Another action that will help to ensure that figures required for permit applications are prepared as needed is to ensure they are included explicitly as project deliverables in the project work breakdown structure (WBS). At the time a project is set up in the Project Delivery Information System (PDIS) these would be identified separately as tasks and deliverables. As PDIS is implemented, TPEAC should monitor improvements in this area.

4. Consider supporting the increased use of aerial imagery for application review

Increasing the use of aerial imagery will also serve to improve the application preparation and review processes. When the applicant uses imagery as a base for a data overlay, it helps a reviewer more quickly associate data with the real world. This will help to sharpen the focus of site visits, or may eliminate the need for other site work entirely. The use of imagery, however, comes with its own issues including availability, the currency of the image and its spatial accuracy. A new interagency cooperative program has been established between the DNR and WSDOT for the development of orthophotography. This will lead to more availability of increasingly current, high-resolution aerial imagery. In addition to aerial orthophotography, the use of other imagery-derived data products (such as land use/land cover and impervious surface) could be expanded. TPEAC could sponsor an effort to explore this area in coordination with the Washington Remote Sensing Data Consortium which is a sub-effort of the Washington Geographic Information Council (WaGIC).

Data Stewardship Focus

5. Investigate ways to ensure that critical, high-value datasets are stewarded and maintained

It is clear parties involved in the permitting process utilize high quality sources of 'base' data developed and maintained by agencies not directly involved with permitting. To the extent these sources contribute high value and relevance to the permitting process, steps should be taken to ensure their continued maintenance and stewardship to meet environmental permitting needs. It is clear that TPEAC agencies have good data, but it is also clear that agencies must commit to better maintenance and update. WaGIC sponsors the spatial data management framework projects that are undertaking local data maintenance with rollups to state and federal views. TPEAC should support efforts by others that seek to improve the quality of all data used in the environmental permitting process.

6. Examine the feasibility of implementing "continuous improvement" programs for highly used, temporally significant datasets

Certain critical datasets used in the preparation and review of permit applications could be put onto a program of continuous improvement. This would require the development of a process to capture data being developed by parties outside of permitting agencies and would include data developed on a project level either by applying agency biologists or consultants using data collection standards (a process similar to the Department of Ecology's data submittal process which serves as part of the Agency's Environmental Information Management System). A number of datasets would be excellent candidates for this approach including: stream location and attributes; wetland delineation and classification; boundaries of impacted areas; locations of mitigation sites; species habitat and observations; and high probability areas for cultural resource occurrence.

Potential datasets that could be improved by continually using information submitted on permit applications can be identified by looking at the Common Data Requirements White Paper developed in coordination with this survey. That paper includes a matrix of information items and which federal, state or local permits require that item. Several permits require information about streams and waterbodies that could be used to build,

update or validate the list of stream name variations or the "tributary of" data elements in the Hydrography Framework efforts. Several common permit information requirements relate to land use, built structures or land cover. These could be used to update current, future/proposed, historic land use / land cover or zoning data sets. Mitigation plans and certain permits require information about wetlands that could be used for historic /current wetland and flood hazard data sets. Project drawing often include proposed elevation contours or high quality survey control that could be used to improve digital elevation models.

The Salmon and Watershed Information Management team that recently built the Natural Resources Data Portal (www.swim.wa.gov) is an available forum where interagency data needs supporting permit content could be addressed. The Information Services Board's subcommittee on Geographic Information Technology is a fairly new group that also has potential for improving statewide data management efforts. Permitting data needs should be communicated to agency representatives on those groups. Specific subject areas that came out in this effort were wetlands and mitigation sites, habitat types, land use / land cover, impervious area and infrastructure.

7. Examine feasibility of specialized training/certification for environmental data users (applicants and reviewers)

Another step for consideration is the development of some type of training/certification program (co-developed by permitting agencies) to ensure applying parties have full understanding of what data are available and appropriate, what their limitations are, and how they should be applied and maintained. The goal of this effort would be to: increase the competency of the reviewer to use good data to provide the correct information; to increase the confidence-level the reviewer has in the information the applicant is providing; and to increase the competency of the review in utilizing data in their work. For type 1 data, the individual whom is trained/certified could be a project engineer responsible for all information relating to the proposed project. For type 2 data, this person could be an agency data manager whom is responsible for all information provided to staff throughout the organization. For applicants with modest staff resources, it may be the individual preparing the actual applications is certified for all types. Such an effort would require training, tool development and establishment of quality control/quality assurance procedures in the use of data at both the applicant and review ends. Before technology solutions can be widely implemented, gaps in basic infrastructure, skills and tools need to be filled. Certification could be implemented through interagency or TPEAC-sponsored cross training.

8. Consider data/permit process consultation to applicants

The responsibility for data management in any data-producing organization should be expanded to include ownership and responsibility for how data are used in the review of permits or in other terms how it is applied to the core business. This would be the role of a data steward. The data manager should serve as a resource to reviewers as to how data are maintained, but they would primarily serve a technical data management function. They would then partner with data stewards whose responsibility would be to promote the appropriate use of the data and respond to new data requirements. A potential alternative approach would be possible if the data manager or data management staff should

understand the permitting process well enough to provide data consultations to applicants and be able to guide them in the correct use of the data for analysis.

Process Focus

9. Investigate a procedure and format for the documentation of data used to prepare application

A first step towards improvement might be to implement a standard method of documenting what datasets are used and some key attributes (metadata) relative to their source, currency, accuracy and scale. This would apply to both types 1 and 2 data as they are described in the prior section. In terms of type 2 data, the standard must acknowledge the differences in available data coverage and quality between geographic areas. This documentation method would immediately provide the reviewer an understanding of data limitations and inform the focus of their review. It may be the case that the review deems a source inadequate and can send the applicant back for more work before spending time in field. Applicant may be encouraged to seek out and use more accurate and current data if they are required to provide the source. This idea could be taken a step further with larger agencies working with large-scale, major projects. In these cases, the applicant agency (WSDOT, for instance) could provide access for the resource agency to the actual data used to develop the application.

The documentation on the data used prepare the permit application could be integrated into the data requirements tool described in the Common Data Requirements White Paper developed in coordination with this paper.

10. Permit application review process mapping

The development and communication of process and procedure definitions would facilitate communication between those whom are focused towards data management and those whom are focused towards application review. This would help to ensure business needs are being met and data are being used. Definitions should be developed in a common format across individual programs so they can be effectively compared and contrasted. This process will differ between small projects and large-scale, major projects. Where data inputs and outputs occur, additional detail should be developed to clearly document how the data are used. The practice of process mapping would be a valuable tool in this effort.

This activity would be a valuable early action item for TPEAC to consider. The results of this exercise will inform other recommendations proposed in the Common Data Requirements White Paper. Process mapping would provide additional insight into the common data elements matrix by identifying where data comes from, where it moves to in the process, and how each individual element gets into the final package and what happens to it after review.

The results of the process mapping will, in addition, provide a discussion platform to ensure that common data fields mean the same thing to each agency, to establish standard levels of detail for each field (this would differ between small and large projects), and to enable interagency development of processes and forms (i.e. expanding activities like JARPA). For example, Fish Impacts-Avoidance-Mitigation is identified in the Common Data Requirements White Paper as a common data element for 9 separate permits and 5 separate agencies.

List of Survey Participants

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Dave Wischer

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Available Data Survey - Master Available Data Spreadsheet

Data format - What format(s) are the data stored?

For each Data element which relates to you, please answer the following questions in the columns provided at the far right of the spreadsheet.

The list in the spreadsheet contains what might be considered the "universe" of data sources identified to date in the environmental permitting process for Washington State transportation projects. The list has been classified in a number of generic topical terms. The first is by WSDOT's Environmental Activities Corporate Data Model Element. The second is by a federal model effort Mid-Atlantic Environmental Transportation and Environmental (MATE) Framework Group. These values appear in the hidden column titled "MATE_EnvironmentalIssue". Please use these fields to filter the records in this spreadsheet based on the individual topics that are relevant to you and your work.

1. Are you (the agency) responsible for either the creation or maintenance of this data from the viewpoint of other agencies (Yes/No)?
2. Is this data actively managed (Yes/No)? - i.e. are there regular updates or a formal maintenance or distribution program?
3. What is the best known source for data on this topic/subject? Best is current, detailed and complete. (please list)
4. What (primary) format is this data maintained in? (publications/reports, databases/spreadsheets, GIS, CAD, etc..)
5. How would you rank the quality of this data on a scale of 1 to 5? (1 being poor quality, 5 being "meets all permtting needs")
6. How would you rank the accessibilty of this data on a scale of 1 to 5? (1 being poor, 5 being "fully accessible to all who require it")
7. If not in digital data format: Based on value to permitting should this data element be a high priority for conversion to digital?

If you have any questions regarding how to complete this survey, please contact Elizabeth Lanzer, WSDOT EAO Information Program Manager at (360) 705-7476 or Todd Slind, Consultant Support - CH2M HILL (425) 233-3410.

EAO_Category					1. Steward	2. Active Administrati	3. Best Known Source	4. Format	5. Quality Rank	6. Accessibility Rank	7. Need for Digital
WSDOT Corporate Data Model Element	DATASET_NAME		LIST_SOURCE	DataSource / Origin							
Air:AirQualityArea	Carbon Monoxide Nonattainment Areas		NRDP	ECY	Yes	No	Ecology	coverage	4	5	
Air:AirQualityArea	Ozone Nonattainment Areas		NRDP	ECY	Yes	No	Ecology	coverage	4	5	
Air:AirQualityArea	Particulates Nonattainment Areas		NRDP	ECY	Yes	No	Ecology	coverage	4	5	
Earth:Geomorphology	county geological survey maps		MATE								
Earth:Geomorphology	Geological units, including rock formations, unit age, relative age.		NRDP	WADNR / USGS	Yes	Yes	Yes	coverage	4	2	
Earth:Geomorphology	King County Coal Mine Hazard Areas	Geology and Soils	EAO	King Co							
Earth:Geomorphology	King County Erosion Hazard Areas	Geology and Soils	EAO	King Co							
Earth:Geomorphology	King County Faults	Geology and Soils	EAO	King Co							
Earth:Geomorphology	King County Landslide Hazard Areas	Geology and Soils	EAO	King Co							
Earth:Geomorphology	King County Seismic Hazard Areas	Geology and Soils	EAO	King Co							
Earth:Geomorphology	King County Surface Geology	Geology and Soils	EAO	King Co							
Earth:Geomorphology	Unstable slope coverage		NRDP	WADNR	Yes	Yes		Grid-Coverage		2	
Earth:Geomorphology	Unstable Slopes along State Routes			WSDOT							
Earth:NaturalMaterialSource	Aggregate Sources used by WSDOT	Transportation - Features	EAO	WSDOT							
Earth:NaturalMaterialSource	IIP Permitted Facility/Site Database		NRDP	WADNR	Yes	Yes	Yes	?	?	2	
Earth:SoilUnit	Pierce County Soils	Geology and Soils	EAO	Pierce Co.							
Earth:SoilUnit	Soils (SSURGO Database)	Geology and Soils	EAO	USDA/NRCS							
Earth:SoilUnit	Soils (STATSGO Database)	Geology and Soils	EAO	USDA/NRCS							
Earth:SoilUnit	Soils data, including drainage rates, erosion potential, flood potential, forest suitability.		NRDP	WADNR	Yes	Yes		coverage	3	2	
Earth:Terrain	10 meter Digital Elevation Model (DEM)		NRDP	USGS							
Earth:Terrain	30 meter Digital Elevation Model (DEM)		NRDP	WADNR	Yes	Yes	No	coverage	3	2	
Earth:Terrain	90 meter Digital Elevation Model (DEM)		NRDP	WADNR	Yes	Yes	No	coverage	3	2	
Earth:Terrain	Elevation Contours: 40 foot contours derived from scanned US Geological Survey elevation data.		NRDP	USGS							
Earth:Terrain	Lake Bathymetry		NRDP	ECY	Yes	No	Ecology	coverage	4	5	
Earth:Terrain	LIDAR from the Puget Sound LIDAR Consortium	Geographic Reference - Imagery	EAO	PSRC							
EnvironmentalHealth:HazardousMaterial	CERCLIS - Comprehensive Environment Response Compensation a	Envi Health - Hazardous Materials	EAO	ECY	No	No	EPA	coverage	?	5	
EnvironmentalHealth:HazardousMaterial	Contaminated Sites, WSDOT	Envi Health - Hazardous Materials	EAO	WSDOT							
EnvironmentalHealth:HazardousMaterial	CSCS - Confirmed and Suspected Contaminated Sites	Envi Health - Hazardous Materials	EAO	ECY	Yes	?	Ecology - Toxics Cleanup Pro	database	?	5	
EnvironmentalHealth:HazardousMaterial	LUST - Leaking Underground Storage Tanks	Envi Health - Hazardous Materials	EAO	ECY	Yes	?	Ecology - Toxics Cleanup Pro	database	?	5	
EnvironmentalHealth:HazardousMaterial	RCRA Facilities - generators, transporters, treaters, storers, and dispo	Envi Health - Hazardous Materials	EAO	EPA	No	No	EPA	?	?	5	
EnvironmentalHealth:HazardousMaterial	SEDQUAL - Sediment Quality Sampling & Monitoring			ECY	Yes	Yes	Ecology - Toxics Cleanup Pro	shapefile	4	4	
EnvironmentalHealth:MonitoringSite	field visit (to identify gas stations, drycleaners, etc.)		MATE								
EnvironmentalHealth:MonitoringSurvey	EMAP data		NRDP	ECY	No	No	EPA	?	4	?	
EnvironmentalHealth:MonitoringSurvey	Environmental Information Management (EIM) System		NRDP	ECY	Yes	Yes	Ecology	coverage	4	5	
EnvironmentalHealth:MonitoringSurvey	EPA databases and website		MATE								
EnvironmentalHealth:WaterQualityMonitoringSite	Ambient Monitoring Stations - marine & freshwater		NRDP	ECY	Yes	Yes	Ecology	coverage	4	5	
EnvironmentalHealth:WaterQualityMonitoringSite	Baseflow Stations (streamflow characteristic)		NRDP	ECY	Yes	Yes	Ecology	coverage	4	5	
EnvironmentalHealth:WaterQualityMonitoringSite	National Pollutant Discharge Elimination System Permit Area Cedar/R	Envi Health - Water Quality	EAO	WSDOT							
EnvironmentalHealth:WaterQualityMonitoringSite	National Pollutant Discharge Elimination System Permit Area Clark C	Envi Health - Water Quality	EAO	WSDOT							
EnvironmentalHealth:WaterQualityMonitoringSite	National Pollutant Discharge Elimination System Permit Area Island/S	Envi Health - Water Quality	EAO	WSDOT							
EnvironmentalHealth:WaterQualityMonitoringSite	National Pollutant Discharge Elimination System Permit Area South F	Envi Health - Water Quality	EAO	WSDOT							
EnvironmentalHealth:WaterQualityMonitoringSite	National Pollutant Discharge Elimination System Permit Area Spokan	Envi Health - Water Quality	EAO	WSDOT							
EnvironmentalHealth:WaterQualityMonitoringSite	National Pollutant Discharge Elimination System Sites: sites holding t	Envi Health - Water Quality	EAO	ECY	No	No	EPA	coverage	4	5	
EnvironmentalHealth:WaterQualityMonitoringSite	Stream flow		NRDP	ECY	No	No	USGS	coverage	4	?	
EnvironmentalHealth:WaterQualityMonitoringSite	Stream Flow Gauges (1993)		NRDP	USGS/ECY	No	No	USGS	coverage	4	2	
EnvironmentalHealth:WaterQualityMonitoringSite	WA Flow Control Stations		NRDP	ECY							
EnvironmentalHealth:WaterQualityMonitoringSurvey	1994, 1996 & 1998 303(d) Listed Streams and Water Bodies.		NRDP	ECY	Yes	Yes	Ecology	shapefile	4	5	
EnvironmentalHealth:WaterQualityMonitoringSurvey	existing surveys, studies and published reports on species occurrence and water quality		MATE								
EnvironmentalHealth:WaterQualityMonitoringSurvey	Sadie		NRDP	WSDOH							
EnvironmentalHealth:WaterQualityMonitoringSurvey	Section 305(b) Reports - 1994 & 1996 & 1998		NRDP	ECY	Yes	Yes	Ecology	shapefile	4	4	
Location:LocationImage	aerial photographs		MATE								
Location:LocationImage	Digital Orthophoto Quarter Quads		NRDP	USGS/USFS/ECY							
Location:LocationImage	Digital Raster Graphics - Scanned USGS Quads	Geographic Reference - Imagery	EAO	USGS							

Available Data Survey - Master Available Data Spreadsheet

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EAO_Category					1. Stewarded	2. Active Administrative	3. Best Known Source	4. Format	5. Quality Rank	6. Accessibility Rank	7. Need for Digital
WSDOT Corporate Data Model Element	DATASET_NAME	LIST_SOURCE	DataSource / Origin								
Location:LocationImage	infrared aerial photographs		MATE								
Location:LocationImage	LandSat7 Terrain Corrected Images (WA State Remote Sensing Consortium)		NRDP	WARSC							
Location:LocationImage	Nautical Charts		NRDP	NOAA/ECY							
Location:LocationImage	Orthophoto Images: Black and white map-corrected aerial photography		NRDP	WSDOH, ECY ??							
Location:LocationImage	Orthophoto Information: Township grid showing year, project name, and initiating agency of the orthophoto aerial photo		NRDP	WADNR	Yes	Yes	Yes - Statewide	coverage	4	2	
Location:LocationImage	Orthophoto of the Puget Sound Area	Geographic Reference - Imagery	EAO	Nies Mapping							
Location:LocationImage	Orthophotos - WADNR - Statewide	Geographic Reference - Imagery	EAO	WADNR	Yes	Yes	? Counties/cities may have b	TIF	4	2	
Location:LocationImage	Orthophotos - WSDOT - Hi Res Project Areas	Geographic Reference - Imagery	EAO	WSDOT							
Location:LocationImage	Shaded Relief of Washington State	Geographic Reference - Imagery	EAO	WADNR							
Location:LocationReferenceMethod	Coastal Oblique Photo Points		NRDP	ECY	Yes	Yes	Ecology	coverage	4	4	
Location:LocationReferenceMethod	Public Land Survey - Township, Range, Section Lines	Geographic Reference - Feature Data	EAO	WADNR	Yes	Yes	Yes	SDE	4	2	
Location:LocationReferenceMethod	Quarter/Quarter Sections Points Coverage		NRDP	ECY	No	No	Not for external distribution	coverage	3	1	
Location:LocationReferenceMethod	USGS 1:62.5K Quad Bnd		NRDP	USGS							
Location:LocationReferenceMethod	USGS 100K Quad Bnd		NRDP	USGS							
Location:LocationReferenceMethod	USGS 250K Quad Bnd		NRDP	USGS							
Location:LocationReferenceMethod	USGS 7.5' Quad Bnd		NRDP	USGS							
Location:LocationReferenceMethod	WA State Plane Zones	Geographic Reference - Feature Data	EAO	WADNR							
Location:LocationReferenceObject	Survey Monuments	Geographic Reference - Feature Data	EAO	Geod Survey							
Organization:Company	employee database information from major employers		MATE								
Organization:NaturalPerson	interviews with farm owners/operators		MATE								
Organization:NaturalPerson	public input		MATE								
Organization:Person	WSDOT staff (planners, engineers, travel forecasters, etc.)		MATE								
PlantsAndAnimals:Habitat	?WHP		NRDP	WSDOH							
PlantsAndAnimals:Habitat	Checker-Mallow Critical Habitat (Proposed)	Plants and Animals	EAO	USFW							
PlantsAndAnimals:Habitat	Cooperative Monitoring Evaluation and Research (CMER)		NRDP	NWIFC							
PlantsAndAnimals:Habitat	Distinct Population Segments for Bull Trout	Plants and Animals	EAO	USFW							
PlantsAndAnimals:Habitat	Distinct Population Segments for Cutthroat	Plants and Animals	EAO	USFW							
PlantsAndAnimals:Habitat	Ecoregions of Oregon and Washington		NRDP	EPA							
PlantsAndAnimals:Habitat	Endangered Species Act Areas for Bull Trout	Plants and Animals	EAO	USFW							
PlantsAndAnimals:Habitat	Endangered Species Act Watershed Resource Inventory Area Listing	Plants and Animals	EAO	WDFW							
PlantsAndAnimals:Habitat	Evolutionarily Significant Units - Chinook	Plants and Animals	EAO	NMFS							
PlantsAndAnimals:Habitat	Evolutionarily Significant Units - Chum	Plants and Animals	EAO	NMFS							
PlantsAndAnimals:Habitat	Evolutionarily Significant Units - Coastal Cutthroat Trout	Plants and Animals	EAO	NMFS							
PlantsAndAnimals:Habitat	Evolutionarily Significant Units - Coho	Plants and Animals	EAO	NMFS							
PlantsAndAnimals:Habitat	Evolutionarily Significant Units - Sockeye	Plants and Animals	EAO	NMFS							
PlantsAndAnimals:Habitat	Evolutionarily Significant Units - Steelhead	Plants and Animals	EAO	NMFS							
PlantsAndAnimals:Habitat	Game Management Units	Plants and Animals	EAO	WDFW							
PlantsAndAnimals:Habitat	Habitat Conservation Plan Lands	Plants and Animals	EAO	USFW							
PlantsAndAnimals:Habitat	Limiting Factor Analysis		NRDP	CC							
PlantsAndAnimals:Habitat	Lower Columbia Steelhead Initiative	Plants and Animals	EAO	ECY							
PlantsAndAnimals:Habitat	Marbled Murrelet Critical Habitat	Plants and Animals	EAO	USFW							
PlantsAndAnimals:Habitat	Skagit County Intertidal Habitat Inventory (1996)		NRDP	WADNR	Yes	Sort of	WADNR or Local Jurisdiction	GIS	4 or 5	5	Already
PlantsAndAnimals:Habitat	Spotted Owl Critical Habitat	Plants and Animals	EAO	USFW							
PlantsAndAnimals:Habitat	Spotted Owl Special Emphasis Areas	Plants and Animals	EAO	WADNR	Yes	No	WADNR	GIS	5	3	Already
PlantsAndAnimals:Habitat	SSHEAR - Fish Barrier Inventory		NRDP	WDFW							
PlantsAndAnimals:Habitat	SSHAP - Fish Distribution	Plants and Animals	EAO	WDFW							
PlantsAndAnimals:Habitat	SSHAP - Fish Passage Structure Inventory	Plants and Animals	EAO	WDFW							
PlantsAndAnimals:Habitat	SSHAP - WRIAs 1-23 - Habitat Characterization		NRDP	NWIFC							
PlantsAndAnimals:Habitat	SSHAP WRIAs 24-62 - Habitat Characterization		NRDP	WDFW							
PlantsAndAnimals:Habitat	Thurston County - Sensitive Areas	Plants and Animals	EAO	Thurston Co.							
PlantsAndAnimals:Habitat	Washington GAP Land Cover		NRDP	WDFW							
PlantsAndAnimals:Habitat	Washington Historic Habitats		NRDP	Northwest Habitat Institute							
PlantsAndAnimals:Habitat	Whatcom County Intertidal Habitat Inventory (1995)		NRDP	WADNR	Yes	Sort of	WADNR or Local Jurisdiction	GIS	4 or 5	5	Already
PlantsAndAnimals:SpeciesSurvey	?CWT		NRDP	WDFW							

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WSDOT Corporate Data Model Element	DATASET_NAME		LIST	SOURCE DataSource / Origin							
PlantsAndAnimals:SpeciesSurvey	?LIFT		NRDP	WDFW							
PlantsAndAnimals:SpeciesSurvey	?PSSP/OSP		NRDP	WDFW							
PlantsAndAnimals:SpeciesSurvey	?SGS		NRDP	WDFW							
PlantsAndAnimals:SpeciesSurvey	Checker-Mallow Sites	Plants and Animals	EAO	USFW							
PlantsAndAnimals:SpeciesSurvey	Marbled Murrelet Detection Locations	Plants and Animals	EAO	WDFW							
PlantsAndAnimals:SpeciesSurvey	Marbled Murrelet Detection Sections	Plants and Animals	EAO	WDFW							
PlantsAndAnimals:SpeciesSurvey	Marbled Murrelet Detection Sections, Buffered	Plants and Animals	EAO	WDFW							
PlantsAndAnimals:SpeciesSurvey	Marine Resources		NRDP	WDFW							
PlantsAndAnimals:SpeciesSurvey	Plant Heritage - Rare and Native Plants - WA Sound (current)	Plants and Animals	EAO	WADNR	Yes	Yes	WADNR	GIS	-	4	Already
PlantsAndAnimals:SpeciesSurvey	Plant Heritage - Rare and Native Plants - WA state (historical)	Plants and Animals	EAO	WADNR	Yes	Yes	WADNR	GIS	-	4	Already
PlantsAndAnimals:SpeciesSurvey	Puget Sound Atlas GIS Database (1992)		NRDP	PSAT/EPA							
PlantsAndAnimals:SpeciesSurvey	SalmonScape (application)		NRDP	WDFW							
PlantsAndAnimals:SpeciesSurvey	Seabird Colonies	Plants and Animals	EAO	WDFW							
PlantsAndAnimals:SpeciesSurvey	Snohomish River Basin Fish Workshop Data 1995	Plants and Animals	EAO	SnoFish							
PlantsAndAnimals:SpeciesSurvey	Sport Catch Record Cards		NRDP	WDFW							
PlantsAndAnimals:SpeciesSurvey	Spotted Owl Sites	Plants and Animals	EAO	WDFW							
PlantsAndAnimals:SpeciesSurvey	Wildlife Heritage Data	Plants and Animals	EAO	WDFW							
PlantsAndAnimals:SpeciesSurvey	Fish and Wildlife Species:surveys, studies, and published reports on	Fish and Wildlife	MATE								
PlantsAndAnimals:SpeciesSurvey	Fish Distribution and Use		NRDP	WDFW							
PlantsAndAnimals:SpeciesSurvey	Natural Heritage elements showing approximate locations and status	information for rare plants, rare animals, terres	NRDP	WADNR	Yes	Yes	WADNR	GIS	-	4	Already
PlantsAndAnimals:SpeciesSurvey	Priority Habitat Species database		NRDP	WDFW							
PlantsAndAnimals:SpeciesSurvey	Salmon stock, fish presence (SaSI).		NRDP	WDFW							
Project:Project	committed capital projects in study area		MATE								
Project:Project	Grant Project Data		NRDP	IAC							
Project:Project	IACOR Habitat Conservation Projects	Plants and Animals	EAO	IACOR							
Project:Project	IACOR Outdoor Recreation Projects	Plants and Animals	EAO	IACOR							
Project:Project	IACOR Wildlife and Recreation Projects	Plants and Animals	EAO	IACOR							
Project:Project	Transportation Capital Improvement Project Plans		NRDP	WSDOT							
Project:Project	Uniform Environmental Project Reporting System (UEPRS)		NRDP	WSDOT							
Project:ProjectResource	Transportation Project Priority Array Tracking System	Transportation - Projects and Classifications	EAO	WSDOT							
Project:ProjectResource	WSDOT cost estimate guidelines		MATE								
PublicServiceUtility:PublicServiceFacility	Dam Safety database.		NRDP	ECY	Yes	Yes	Ecology - must request	coverage	4	3	
PublicServiceUtility:PublicServiceFacility	IIP Permitted Facility/Site Database		NRDP	ECY	Yes	Yes	Ecology	coverage	4	5	
PublicServiceUtility:PublicServiceFacility	Permitted Landfills		NRDP	ECY	Yes	Yes	Ecology	coverage	4	4	
PublicServiceUtility:Railroad	1990 & 2000 U.S. Census TIGER - Railroads		NRDP	Census							
PublicServiceUtility:Railroad	Railroads in active operation.		NRDP	WSDOT							
PublicServiceUtility:Railroad	Railroads, at 24K	Transportation - Features	EAO	WSDOT							
PublicServiceUtility:Railroad	Railroads, at 500K	Transportation - Features	EAO	WSDOT							
PublicServiceUtility:Railroad	Railroads-abandoned, at 24K	Transportation - Features	EAO	WSDOT							
PublicServiceUtility:Railroad	Railroads-abandoned, at 500K	Transportation - Features	EAO	WSDOT							
PublicServiceUtility:Railroad	WA County Series, Railroads	Transportation - Features	EAO	WSDOT							
PublicServiceUtility:Utility	1990 & 2000 U.S. Census TIGER - Utility Lines		NRDP	Census							
PublicServiceUtility:Utility	Petroleum Pipelines of WA	Transportation - Features	EAO	WUTC							
PublicServiceUtility:Utility	Whatcom County - Gas and Oil Pipelines	Transportation - Features	EAO	Whatcom Co							
RealEstate:Parcel	Abandoned railroads and rights-of-way.		NRDP	WSDOT							
RealEstate:Parcel	historic real estate values		MATE								
RealEstate:Parcel	Island County Parcels - Clinton	Political and Admin. Boundaries	EAO	Island Co							
RealEstate:Parcel	Island County Parcels - Ebey	Political and Admin. Boundaries	EAO	Island Co							
RealEstate:Parcel	Island County Parcels - Freeland	Political and Admin. Boundaries	EAO	Island Co							
RealEstate:Parcel	Kitsap County - Parcels (with Land, Building, and Tax Account tables	Political and Admin. Boundaries	EAO	Kitsap Co							
RealEstate:Parcel	Public Lands Inventory Report		NRDP	IAC							
RealEstate:Parcel	Public Lands Ownership parcels for federal, state, county, city, and tribal lands within Washington (MPL)		NRDP	BLM/WADNR	Yes	Yes	Only Source Known	coverage	3	2	
RealEstate:Parcel	tax maps		MATE								
RealEstate:Parcel	Thurston County Parcels	Political and Admin. Boundaries	EAO	Thurston Co.							

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RealEstate:Parcel	Whatcom County - Parcels	Political and Admin. Boundaries	EAO		Whatcom Co						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Congressional Districts, 1990	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Congressional Districts, 2000		NRDP		Redistricting Commission						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	County Boundaries: County boundaries as derived from Department of Natural Resources' Public Land Survey, Ow		NRDP		WADNR	Yes	Yes	No - Individual Counties	coverage - SDE	3	2
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	DNR Managed Lands: Surface trust lands managed by Department of Natural Resources(DNR) (Cadastral)		NRDP		WADNR	Yes	Yes	Yes	SDE - coverage	4	2
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	DOT Maintenance Areas	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	DOT Regions, at 24K	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	DOT Regions, at 500K	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	ECY Regions		NRDP		ECY	Yes	Yes	Ecology	coverage	5	5
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Highway Urban Areas (FHwA defined)	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Incorporated Municipalities of Washington State, at 24K	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	King County Urban Growth Line, 1999	Political and Admin. Boundaries	EAO		King Co						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Kitsap County - Urban Growth Boundaries	Political and Admin. Boundaries	EAO		Kitsap Co						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Kitsap County Cities	Political and Admin. Boundaries	EAO		Kitsap Co						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Legislative Districts of WA State, 1990	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Legislative Districts of WA State, 2000	Political and Admin. Boundaries	EAO		Redist Com						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Local Air Pollution Control Authority Regions		NRDP		ECY	Yes	No	Ecology	coverage	5	5
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Major Cities (Points at 24K)	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Major Cities (points)	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Military Reservations at 24 K	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	National Forest Lands at 24K	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	National Forest Lands at 500K	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	National Parks	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	National Recreation Areas	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	National Scenic Areas	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Pierce County Cities	Political and Admin. Boundaries	EAO		Pierce Co						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Pierce County Urban Growth/Urban Service Areas	Political and Admin. Boundaries	EAO		Pierce Co						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Populated Places of Washington State		NRDP		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Postal Service Zip Codes		NRDP		ESRI/OFM/ECY						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Regional Transportation Planning Organizations/Metropolitan Plannin	Political and Admin. Boundaries	EAO		WSDOT						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Salmon Recovery Regions		NRDP		WDFW						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	State of Washington State outline (Cadastral)		NRDP		WADNR	Yes	Yes	Not Sure	SDE - coverage	3	2
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	State Tribal Lands		NRDP		ECY/WADNR						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Aquatic Division Tideland Ownership		NRDP		WADNR	Yes	Yes	WADNR (probably)	case by case	-	1 Yes
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Urban Growth Boundaries of the Puget Sound Regional Council	Political and Admin. Boundaries	EAO		PSRC						
SocialEconomicCultural:CivilAndJurisdictionalAndAdministrativeAreas	Watershed Administrative Unit(WAU) boundaries,		NRDP		WADNR	Yes	Yes	WADNR	coverage	4	4.5 Yes
SocialEconomicCultural:HistoricalAndArchaeologicalResource	existing inventories		MATE								
SocialEconomicCultural:HistoricalAndArchaeologicalResource	National Register of Historic Places in WA	Political and Admin. Boundaries	EAO		NPS						
SocialEconomicCultural:HistoricalAndArchaeologicalResource	SHPO and THPO (mapping, existing inventory forms, etc.)		MATE		OAHP						
SocialEconomicCultural:HistoricalAndArchaeologicalResource	windshield surveys and field views		MATE								
SocialEconomicCultural:LandUse	Benton Co. Land Use/Land Cover (Hanford)		NRDP		ECY	No	No	USDOE-Hanford	Grid?	4	1
SocialEconomicCultural:LandUse	City of Tacoma Zoning	Political and Admin. Boundaries	EAO		Tacoma						
SocialEconomicCultural:LandUse	Dairy Farms 2001		NRDP		ECY	Yes	Yes	Ecology - 2002 available	coverage	4	5
SocialEconomicCultural:LandUse	Island County Shoreline Designations	Water - Surface Hydrography & Wetlands	EAO		Island Co						
SocialEconomicCultural:LandUse	Island County Zoning	Political and Admin. Boundaries	EAO		Island Co						
SocialEconomicCultural:LandUse	King County Comprehensive Plan Land Use, 1999	Political and Admin. Boundaries	EAO		King Co						
SocialEconomicCultural:LandUse	King County Countywide Zoning	Political and Admin. Boundaries	EAO		King Co						
SocialEconomicCultural:LandUse	Kitsap County - Comprehensive Plan	Political and Admin. Boundaries	EAO		Kitsap Co						
SocialEconomicCultural:LandUse	Kitsap County - Limited Areas of More Intense Rural Development	Political and Admin. Boundaries	EAO		Kitsap Co						
SocialEconomicCultural:LandUse	Kitsap County - Zoning	Political and Admin. Boundaries	EAO		Kitsap Co						
SocialEconomicCultural:LandUse	Kitsap County Shoreline Designations	Water - Surface Hydrography & Wetlands	EAO		Kitsap Co						
SocialEconomicCultural:LandUse	Land Use, Land Cover (PRISM)		NRDP		UW						
SocialEconomicCultural:LandUse	Shoreline Management Act - Streams, Float points		NRDP		USGS/WDFW/ECY						
SocialEconomicCultural:LandUse	Thurston County Zoning	Political and Admin. Boundaries	EAO		Thurston Co.						

Available Data Survey - Master Available Data Spreadsheet

Data format - What format(s) are the data stored?

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EAO_Category					1. Stewarded	2. Active Administration	3. Best Known Source	4. Format	5. Quality Rank	6. Accessibility Rank	7. Need for Digital
WSDOT Corporate Data Model Element	DATASET NAME	LIST SOURCE	DataSource / Origin								
SocialEconomicCultural:LandUse	USGS Land Use/Land Cover (GIRAS)		NRDP	USGS							
SocialEconomicCultural:LandUse	USGS Land Use/Land Cover (MRLC)		NRDP	USGS/ECY							
SocialEconomicCultural:LandUse	WA Land Use/Land Cover (MRLC) Updated		NRDP	USGS/ECY							
SocialEconomicCultural:LandUse	Whatcom County - Zoning	Political and Admin. Boundaries	EAO	Whatcom Co							
SocialEconomicCultural:LandUse	Yakima Land Use/Land Cover - 1991Update		NRDP	ECY	No	No	Ecology	Grid	4	3	
SocialEconomicCultural:SocioEconomicFeature	Census Urbanized Areas	Political and Admin. Boundaries	EAO	USCB							
SocialEconomicCultural:SocioEconomicFeature	Puget Sound Regional Traffic Forecast Analysis Zones	Geographic Reference - Feature Data	EAO	PSRC							
SocialEconomicCultural:SocioEconomicFeature	Puget Sound Regional Transportation Analysis Zones	Geographic Reference - Feature Data	EAO	PSRC							
SocialEconomicCultural:SocioEconomicFeature	TIGER - U.S. Census Bureau base maps - 1995	Geographic Reference - Feature Data	EAO	USCB							
SocialEconomicCultural:SocioEconomicFeature	TIGER - U.S. Census Bureau base maps - 2000 (includes poverty an	Geographic Reference - Feature Data	EAO	USCB							
SocialEconomicCultural:SocioEconomicFeature	U.S. Census-Based Socio-Economic Data	Geographic Reference - Feature Data	EAO	ESRI/GDT							
StormwaterManagementFeature:Outfall	Stormwater Outfall Inventory (on State Routes)	Envi Health - Water Quality	EAO	WSDOT							
TransportationFeature:Bridge	Bridge locations along state and some local roads.		NRDP	WSDOT							
TransportationFeature:HighwaySection	1990 & 2000 U.S. Census TIGER - Arterials, City Streets, County Roads		NRDP	Census							
TransportationFeature:HighwaySection	1990 U.S. Census TIGER - Federal & State Hwys		NRDP	Census							
TransportationFeature:HighwaySection	GDT Dynamap Transportation	Transportation - Roads	EAO	GDT							
TransportationFeature:HighwaySection	Island County Streets	Transportation - Roads	EAO	Island Co							
TransportationFeature:HighwaySection	King County Streets (geocoding)	Transportation - Roads	EAO	King Co							
TransportationFeature:HighwaySection	Kitsap County Roads	Transportation - Roads	EAO	Kitsap Co							
TransportationFeature:HighwaySection	Local Roads: County roads that fall within a state road right-of-way or are classified as a main arterial by the Departm		NRDP	WSDOT							
TransportationFeature:HighwaySection	Major Roads of Washington		NRDP	USGS/ECY							
TransportationFeature:HighwaySection	roadway functional classification maps		MATE								
TransportationFeature:HighwaySection	State Highways - State Routes (mainlines) LRS, at 500K	Transportation - Roads	EAO	WSDOT							
TransportationFeature:HighwaySection	State Highways - State Routes LRS, at 24K	Transportation - Roads	EAO	WSDOT							
TransportationFeature:HighwaySection	State Roads: Primary state arterial routes		NRDP	WSDOT							
TransportationFeature:HighwaySection	State Route GPS Lines	Transportation - Roads	EAO	WSDOT							
TransportationFeature:HighwaySection	Thurston County Roads	Transportation - Roads	EAO	Thurston Co.							
TransportationFeature:HighwaySection	Tunnels - State Route	Transportation - Features	EAO	WSDOT							
TransportationFeature:HighwaySection	Under Crossings on State Routes	Transportation - Features	EAO	WSDOT							
TransportationFeature:NonmotorizedFacility	WSDOT bike and pedestrian plan		MATE								
TransportationFeature:RoadsideComponent	Roadside Adjacent Land Use: Roadside landscape classification		NRDP	WSDOT							
TransportationFeature:RoadsideComponent	Roadside Special Maintenance Areas	Transportation - Projects and Classifications	EAO	WSDOT							
TransportationFeature:RoadsideComponent	Roadside Special Maintenance Areas - NW Region	Transportation - Projects and Classifications	EAO	WSDOT							
TransportationFeature:SupportFacility	Rest Areas	Transportation - Features	EAO	WSDOT							
TransportationFeature:TransitFacility	existing transit routes		MATE								
TransportationFeature:TransitFacility	Public Park and Ride Lots	Transportation - Features	EAO	WSDOT							
TransportationFeature:TransportationObservation	travel demand modeling results		MATE								
TransportationFeature:TransportationObservation	updated and verified traffic data (for noise studies)		MATE								
TransportationSystem:TransportationSystem	Freight and Goods Transportation System - State Routes	Transportation - Projects and Classifications	EAO	WSDOT							
TransportationSystem:TransportationSystem	State Ferry Routes		NRDP	WSDOT							
TransportationSystem:TransportationSystem	State Route Features Road Log (GIS version)	Transportation - Features	EAO	WSDOT							
TransportationSystem:TransportationSystem	Transportation layer (major roads, forest roads, some public roads, railroads, ferry routes).		NRDP	WADNR	Yes	Yes	On Forest Roads, not others	coverage	3	2	
TransportationSystem:TransportationSystem	WA Highways of Statewide Significance	Transportation - Projects and Classifications	EAO	WSDOT							
Water:CoastalArea	Coastlines, Puget Sound and Columbia River (Major Shorelines for c	Water - Surface Hydrography & Wetlands	EAO	WSDOT							
Water:CoastalArea	Estuaries	Water - Surface Hydrography & Wetlands	EAO	ECY	No	No	?	?	?	?	
Water:CoastalArea	Marine (saltwater) Shorelines		NRDP	USGS/WADNR/ECY	No	Yes	WADNR	coverage	5	5	
Water:Floodplain	FEMA Floodzones (FIRM by county) - statewide	Water - Surface Hydrography & Wetlands	EAO	FEMA							
Water:Floodplain	Island County Critical Drainage Areas	Water - Surface Hydrography & Wetlands	EAO	Island Co							
Water:Floodplain	Thurston County - Floodzones (100 and 500 yr. floods)	Water - Surface Hydrography & Wetlands	EAO	Thurston Co.							
Water:Groundwater	Groundwater Management Areas		NRDP	ECY	No	No	Ecology - no custodian	coverage	1	3	
Water:Groundwater	Protection Area 1 Year: Group A wellhead protection area showing one-year Time of travel zones		NRDP	WSDOH							
Water:Groundwater	Protection Area 10 Years: Group A wellhead protection area showing 10-year Time of travel zones		NRDP	WSDOH							
Water:Groundwater	Protection Area 5 Years: Group A wellhead protection area showing 5-Year Time of travel zones		NRDP	WSDOH							
Water:Groundwater	Protection Area 6 Months: Group A wellhead protection area showing six- month Time of travel zones		NRDP	WSDOH							

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EAO_Category		1. Stewarded2. Active Administrative3. Best Known Source4. Format5. Quality Rank6. Accessibility Rank7. Need for Digital						
WSDOT Corporate Data Model Element	DATASET_NAME	LIST_SOURCE	DataSource / Origin					
Water:Groundwater	Protection Area 600 Feet: Group B wellhead protection area showing 600 feet Time of travel zones	NRDP	WSDOH					
Water:Groundwater	Sole Source Aquifers	EAO	EPA					
Water:Groundwater	Thurston County - Wellhead Protection Zones	EAO	Thurston Co.					
Water:Groundwater	Wellhead Protection Zones - Statewide	EAO	WADOH					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, by county	NRDP	EPA/ECY/WSDOH	No	No	Counties	coverage	?3
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Clallam County	EAO	WSDOT/Clallam Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Clark County	EAO	WSDOT/Clark Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Cowlitz County	EAO	WSDOT/Cowlitz Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Franklin County	EAO	WSDOT/Franklin Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Island County	EAO	WSDOT/Island Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Jefferson County	EAO	WSDOT/Jefferson Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, King County	EAO	WSDOT/King Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Lewis County	EAO	WSDOT/Lewis Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Lincoln County	EAO	WSDOT/Lincoln Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Pend Oreille County	EAO	WSDOT/Pend Oreille Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Pierce County	EAO	WSDOT/Pierce Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Spokane County	EAO	WSDOT/Spokane Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Thurston County	EAO	WSDOT/Thurston Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Walla Walla County	EAO	WSDOT/Walla Walla Co.					
Water:GroundwaterDischargeRechargeArea	Critical Aquifer Recharge Areas, Whatcom County	EAO	WSDOT/Whatcom Co.					
Water:GroundwaterDischargeRechargeArea	King County Recharge Areas	EAO	King Co					
Water:GroundwaterDischargeRechargeArea	USGS or state aquifer or groundwater maps/studies	MATE						
Water:Rainfall	Climate and Ocean Conditions?	NRDP	UW					
Water:Rainfall	NOAA Climatological Stations (precip)	NRDP	NOAA					
Water:Rainfall	Precipitation - Annual	NRDP	NOAA					
Water:Rainfall	Precipitation Data	EAO	WADNR	Yes	No	Probably not	coverage	32
Water:Rainfall	Precipitation Intensity (storms)	NRDP	NOAA					
Water:Rainfall	Precipitation Intensity Data	EAO	OSU					
Water:RiverStream	Hydrography Statewide 1:24K	NRDP	WADNR	Yes	Yes	On private and state land	coverage	32
Water:RiverStream	Major Rivers of Washington	EAO	ECY	Yes	Yes	Ecology	coverage	45
Water:RiverStream	NW Hydro Framework at 100k, routed version.	NRDP	REO					
Water:RiverStream	SSHIAP - Stream Segments	EAO	WDFW					
Water:RiverStream	SSHIAP - Stream Size and Flow	EAO	WDFW					
Water:RiverStream	Streamnet-Statewide	EAO	WDFW					
Water:RiverStream	Thurston County - Hydro features	EAO	Thurston Co.					
Water:RiverStream	Water Course Type: Water courses classified by Timber, Fish and Wildlife and DNR's Forest Practices water type code	NRDP	WADNR	Yes	Yes	Yes	coverage	32
Water:WaterBody	Lakes in Washington.	NRDP	ECY	Yes	Yes	Ecology	coverage	45
Water:Waterbody	Major Lakes of Washington (carto needs)	EAO	WSDOT					
Water:Watershed	2496 Grant Watershed Delineations	NRDP	ECY	??	??	?	??	??
Water:Watershed	2514 Grant Watershed Delineations	NRDP	ECY	??	??	?	??	??
Water:Watershed	Corps River Basin maps State sub-watershed mapping or studies	MATE						
Water:Watershed	Hydrological Unit Basins (HUC) 4th, 5th, and 6th field HU's	NRDP	REO					
Water:Watershed	Hydrological Unit Basins (HUC) as defined by USGS.	NRDP	USGS					
Water:Watershed	Puget Sound River Basin Team - watershed assessments adjacent to Puget Sound	NRDP	ECY	No	Yes	Puget Sound Action Team	coverage	43
Water:Watershed	Sub-basins of Watershed Resource Inventory Areas (Watersheds)	EAO	ECY	No	No	WADNR?	coverage	44
Water:Watershed	Water Resource Inventory Areas (Watersheds), at 100K	EAO	ECY	Yes	Yes	Ecology	coverage	44
Water:Watershed	Water Resource Inventory Areas (Watersheds), at 24K	EAO	ECY	Yes	Yes	Ecology	coverage	55
Water:Watershed	Water Rights Adjudicated Watershed	NRDP	ECY	Yes	Yes	Ecology - Water Resources	coverage	43
Water:Watershed	Watershed analysis reports and maps	NRDP	WADNR					
Water:Well	Group A Public Well Locations (Group A wells serve many people and are subject to Federal Safe Drinking Water Act)	NRDP	WSDOH					
Water:Well	Group B Public Well Locations (Group B wells serve fewer people than Group A wells and are subject to state and local laws)	NRDP	WSDOH					
Water:Well	Public Water Supply Wells	NRDP	WSDOH					
Water:Well	USGS Wells from Groundwater Site Information Database	NRDP	ECY	No	No	USGS	coverage	33
Water:Wetland	Island County Wetlands	EAO	Island Co					

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Water:Wetland	National Wetlands Inventory (NWI)		NRDP	USFWS							
Water:Wetland	Thurston County Wetlands	Water - Surface Hydrography & Wetlands	EAO	Thurston Co.							
ZZ:DecisionSupport	AASHTO engineering design manual		MATE								
ZZ:DecisionSupport	Environmental Equity Study		NRDP	ECY	Yes	Yes	Ecology	Library	4	3	
ZZ:DecisionSupport	farmland assessment reports		MATE								
ZZ:DecisionSupport	Salmon Score Card		NRDP	OFM							
ZZ:DecisionSupport	State Agency Action Plan		NRDP	OFM							
ZZ:DecisionSupport	State of Salmon Report		NRDP	OFM							
ZZ:DecisionSupport	Statewide Monitoring Strategy Reports		NRDP	IAC							
ZZ:DecisionSupport	WSDOT engineering design manuals		MATE								
					48	41			3.8	3.5	